SPECIFICATIONS

DATA TERMINAL BUFFER

MODEL 8040

FUNCTION:	
(a) Receive (per channel)	Accepts and processes 120-bits of Kineplex data. Provides parity check.
(b) Transmit (per channel)	Accepts and processes 28, 18-bit words of computer data. Generates parity pattern.
SYNCHRONIZATION:	All rates are derived from IRIG Format "B" Time Code.
DISPLAY:	
(a) Receive (per channel)	Full 120-bit Kineplex format displayed using Amperex 6977 indicators.
(b) Transmit (per channel)	Any of 15 switch selectable Kineplex frames.
OUTPUT ISOLATION:	Relay disconnect actuates when unit is turned off.
MECHANICAL:	Each chassis is slide mounted for ease of maintenance. Cabinet is equipped with 300 CFM blower.
ELECTRICAL:	Power: 58-62 cps, 105-125 V AC, 15 amps, single phase. All outputs short circuit protected. Test points provided on each chassis.
ENVIRONMENTAL:	50°F - 125°F, 0 - 90% relative humidity.
CIRCUIT LOGIC ELEMENTS:	Metric Systems standard logic cards.

METRIC
SYSTEMS CORPORATION

FORT WALTON BEACH, FLORIDA

MODEL
8040

DATA TERMINAL BUFFER

The Model 8040 Data Terminal Buffer (DTB), performs two simultaneous conversions. Computer data words are reformatted for use by a Kineplex data modem for transmission to a remote location, and simultaneously, Kineplex output data being received from a remote location is reformatted for use by a digital computer.

The DTB is divided into two functional areas, receiving and transmitting.

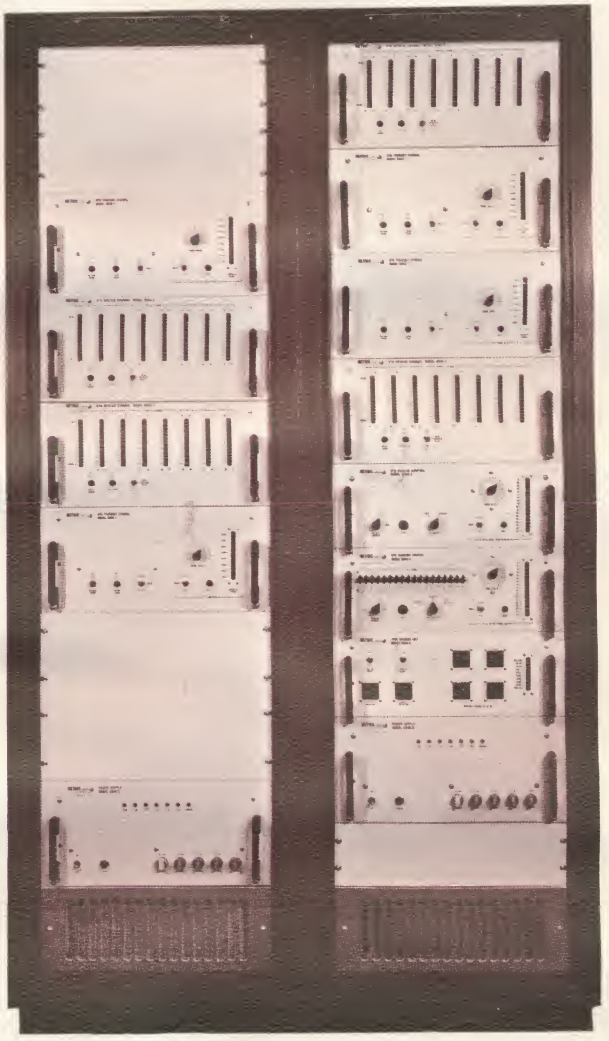
RECEIVE CHANNELS: Each of four receive channels accepts and processes 120 bits of Kineplex data for entry into the computer. A parity check on these data words is performed as the data is received. A front panel alarm is activated by the presence of a parity error.

Individual bit status ("1" or "0") indicator lamps are provided on the front panel, indicating the status of each bit received.

TRANSMIT CHANNELS: Each of four transmit channels accepts and processes 28, 18-bit computer output words. This data is reformatted to be used by the Kineplex data modem for transmission to a remote site. Each channel has independent switch selectable displays of the 15 Kineplex data characters.

Typical use of the Model 8040 DTB is for reformatting radar data for transmission between a remote radar site and a central computer, then reformatting computer-generated pointing information for return transmission to the remote site.

Data may be transmitted between sites and used for plotting boards, etc., by coupling the output of a receive channel to a Metric Systems Model 8041-1-A Digital to Analog Converter.



Models of the 8040 DTB have been delivered that interface with the UNIVAC 1218 and IBM 7288 Computers. Other variations are available.

DIGITAL SYSTEMS

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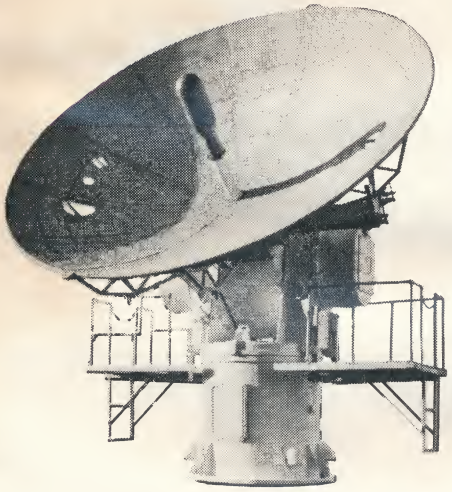
METRIC Systems Corporation

Radar Systems — Range Instrumentation Equipment — Precision Pedestals

METRIC SYSTEM'S LONG RANGE PRECISION TRACKING RADAR

AN/FPQ-11



ANTENNA

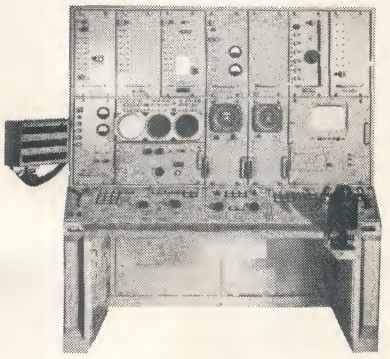
The AN•FPQ-11 Precision Tracking Radar offers features most needed in a modern Instrumentation Radar. Important features of the AN/FPQ-11 are: Dual Receivers for simultaneous reception of skin and beacon signals — Selectable 3 mc and 8 mc IF Bandwidth — Parametric Preamplifier with 3.5 db noise figure — 14 foot dish with 40 db gain — 1000 nautical mile Nth-time-around range tracker with digital readout — Digital Data Outputs in Range, Azimuth, and Elevation — Television Boresight Camera with console mounted Monitor — Handwheel and Joystick Control modes — Selectable automatic tracking in angle using either radar or infrared tracking.

This set is capable of tracking targets at rates in excess of 30 degrees per second in azimuth and 15 degrees per second in elevation with errors less than approximately 0.3 mills. The pedestal accuracy is 10 seconds of arc with levels provided to permit leveling to approximately 6 seconds of arc.

Digital outputs provide 17-bit words in azimuth and elevation and 20 bits in range.

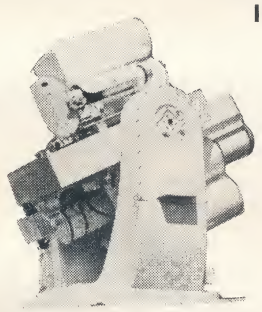
Included is a secondary data system providing analog sine/cos outputs to 0.05%, range 0.005% to 400 K yds. and 0.05% to 2000 K yds.

Synchro inputs and outputs are available to permit slaving to another radar or slaving a remotely located radar from the AN/FPQ-11.



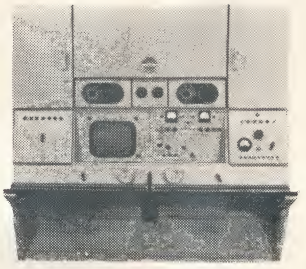
CONTROL CONSOLE

INFRARED TRACKER & SIGNATURE MEASURING SYSTEM



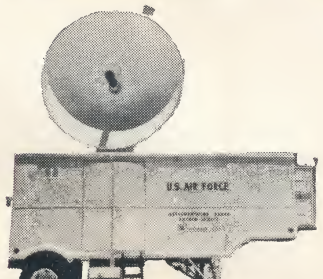
INFRARED TRACKER PEDESTAL

The Signature Measuring System produced by Metric Systems on Contract AF 08(606)-4732, automatically tracks a ballistic missile re-entry and records radiated energy over a spectrum ranging from infrared to ultraviolet. Six optical instruments are mounted on a modified Nike-Ajax Pedestal. Automatic target acquisition and track capability is provided by a dual field of view IR Tracker. A console mounted television monitor and joystick permits manual or automatic control of the pedestal as desired. The system features slaving capabilities to external tracking equipment and 17-bit serial or parallel digital data outputs on both azimuth and elevation.



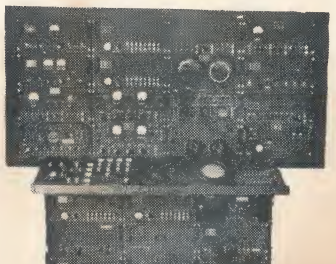
INFRARED TRACKER CONTROL CONSOLE

PRECISION TRACKING RADARS



AN/MPQ-31 RADAR VAN

The AN/MPQ-31 Precision Target Tracking Radar, designed and fabricated by Metric Systems, meets the need for a moderately priced instrumentation radar capable of providing target coordinate data in the wide variety of forms required by modern missile tracking ranges. The MPQ-31 radar provides visual readouts for operator use, multiple speed synchro outputs for slaving external equipment, analog voltage outputs for computer and plotting board operation, and digital outputs for use with digital data systems. Features of the radar are: 750 KW Peak Power, Push-button PRF Selection from 320 pps to 1707 pps, Dual receivers (Beacon and Skin), 10 foot reflector, nutating feed with variable polarization, 5 million yard range unit (nth time–around tracking range unit optional) and Binary Digital Data outputs for range, azimuth, and elevation.



AN/MPQ-31 CONTROL CONSOLE

Metric Systems has produced an assortment of missile range instrumentation equipment with particular emphasis on radars and radar modifications. Metric Systems has outstanding qualifications in the design of radar range measuring equipment, having produced high performance range units for radars such as the SCR-584, MPQ-31, MPS-9, MSQ-1A, the Nike-Ajax Radar, and others. For expert advice on the adaptability of a particular radar to your instrumentation requirement, contact Metric Systems Sales Department.

METRIC Systems Corporation
736 N. BEAL STREET
FORT WALTON BEACH, FLORIDA
Tel: (904) 242-2111

AN/FPQ-11A

TECHNICAL CHARACTERISTICS

TRANSMITTER

POWER	500 KW peak
PULSE WIDTH	0.25 or 0.8 usec selectable during track
PRF	Selectable 410 512 –585 PPS

RECEIVERS

3 receivers, skin, beacon, and auxiliary. Selectable during track. Separate agc and range gates.

NOISE FIGURE (paramp in)	3.5 db

ANTENNA

14' dish

GAIN	39 db
FEED	Conical scan
POLARIZATION	Vertical, horizontal R.H. Circ – L.H. Circ.

RANGE SYSTEM

RANGE	2.000.000 yds. (1000 Kn Mi)
MAX TRACKING RATE	20 K yds/sec.
ACQUISITION	Remote slaving, manual
TRACKING MODES	Selectable wide, or autoselect narrow/ wide gate. Manual, automatic aided, Coast, Designate.
AIDED RATE TRACKING	Yes, to 3100 yds/sec

PRIMARY DATA

AZ and EL RESOLUTION	9.89 seconds
RANGE RESOLUTION	±2 yds
AZ and EL WORD	17-bit binary
RANGE WORD	20-bits
SHIFT PULSE RATE	0 - 50 K PPS
SAMPLING PULSE RATE	10 PPS
SAMPLING PULSE WIDTH	1 usec

DISPLAY

RANGE	A-Scope, 3 scopes, 400 K yds, 32 K yds, 2 K yds, 32 K yd scope also displays LR verify
	Precision dials. Decimal range display
AZIMUTH and ELEVATION	Precision dials. Decimal angle display
SYNCHRONIZATION INPUT	Radar will accept external prf pulses and 82 KC
SECONDARY DATA	Range pots .005% to 400 K yds .05% to 2000 K yds AZ, EL, potentiometers Colvern sine/cos .05%

ANGLE SYSTEM

AZIMUTH	
TRACKING RANGE	±360°
TRACKING RATE	30°/sec
ACCELERATION	15°/sec²
TRACKING MODES	Manual Designate Automatic Coast
ACCURACY	jitter - .15 mil rms bias - .15 mil rms
ELEVATION	
TRACKING RANGE	-1.5° to 181.5°
TRACKING RATE	15°/sec
ACCELERATION	15°/sec²
TRACKING MODES	Manual Designate Automatic Coast
ACCURACY	jitter - .15 mil rms bias - .15 mil rms

METRIC SYSTEMS CORPORATION

FORT WALTON BEACH, FLORIDA

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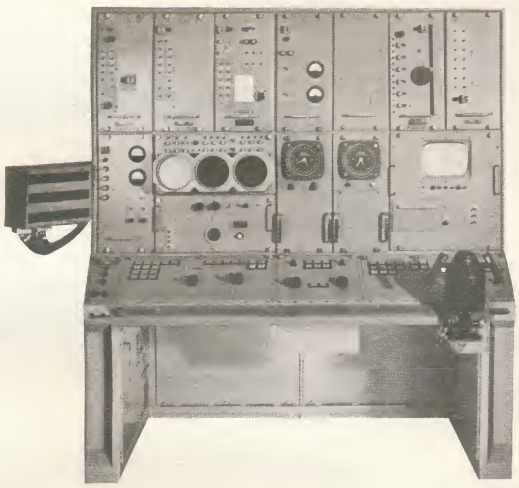
FORT WALTON BEACH, FLORIDA

MODEL 8046

METRIC SYSTEM'S LONG RANGE PRECISION TRACKING RADAR

A new instrumentation radar developed for the Air Force has been delivered to Fort Churchill, Manitoba, Canada. Two of Metric Systems' AN/FPQ–11 Radars are being used by the Office of Aerospace Research. Metric's AN/FPQ–11 Precision Tracking Radar offers features most needed in a modern Instrumentation Radar. Important features of the AN/FPQ–11 are: Dual Receivers for simultaneous reception of skin and beacon signals – Selectable 3 mc and 8 mc IF Bandwidths – Parametric Preamplifier with 3.5 db noise figure – 14 foot dish with 40 db gain – 1000 nautical mile Nth time around range tracker with digital readout – Digital Data Outputs in Range, Azimuth, and Elevation – Television Boresight Camera with console mounted Monitor – Handwheel and Joystick Control modes – Selectable automatic tracking in angle using either radar or infrared tracking.



THE AN/FPQ-11A

RADAR SYSTEMS

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SYSTEMS CORPORATION

FORT WALTON BEACH, FLORIDA

MODEL 8007

MOVING TARGET

SIMULATOR

Automatic Target Simulation AT 160 OR 640 PRF

Metric Systems' Model 8007, Moving Target Simulator, is a special purpose test signal generator designed to simulate the action of a radar target at extended ranges. The Simulator is primarily intended to be used with radars of a specific type, including the AN/FPS–16 (V), AN/FPQ–6, and AN/TPQ–18.

The Moving Target Simulator is designed for operation at a PRF of either 160 or 640 pulses per second. Fine and coarse indicators are provided for range and are calibrated in zones, rather than in yards. At 160 PRF, one zone equals 1,024,000 yards while at 640 PRF, one zone equals 256,000 yards. Switch positions enable the simulator to operate with positive or negative input pulses, as selected.

Operation of the Simulator is fully automatic, once connected to the radar, requiring only initial settings of target range and velocity. All major operating controls are mounted on the front panel. Controls of less frequent usage are located on the rear of the chassis.

The Moving Target Simulator is fully transistorized and requires only a few seconds warm–up time. The entire unit is housed in a single package designed for standard rack, or cabinet, mounting.

RADAR SYSTEMS

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MOVING TARGET SIMULATOR

SPECIFICATIONS

VELOCITY ACCURACY	±5% of full scale
NUMBER OF ZONES OR BINS	18
PULSE JITTER	0.05 microseconds maximum
PRF	160 pps and 640 pps, selectable

INPUT SIGNALS

MODULATOR TRIGGER	Positive or negative pulse train, pulse width at least one microsecond, amplitude 15 to 60 volts
PRE–TRIGGER	Positive or negative pulse train, pulse width at least one microsecond, amplitude 16 to 60 volts. The pre–trigger pulses precede the normal modulator trigger by 16,000 yards (97 microseconds)
FIND–VERIFY BUSS	DC level, 0 volts representing Normal Mode; –4.5 volts representing "Find–Verify" mode

OUTPUT SIGNAL	Pulse train radar PRF. Pulse width 0.25 or one microsecond, selectable. Amplitude 75 volts into 75 ohm load. Positive or negative polarity, selectable
SIMULATED RANGE	5 to 9000 nautical miles at 160 PRF 5 to 2250 nautical miles at 640 PRF
SIMULATED TARGET VELOCITY	Zero to ±400,000 yards per second
SIMULATED RANGE INDICATION	Coarse and fine meter indication Accuracy ±20,000 yards

INPUT & OUTPUT TERMINATIONS

MOD–TRIGGER INPUT	Co–ax receptacle on rear of chassis
PRE–TRIGGER INPUT	Co–ax receptacle on rear of chassis
FIND–VERIFY BUSS INPUT	Barrier strip on rear of chassis
AC POWER INPUT	Barrier strip on rear of chassis
OUTPUT	Co–ax receptacle on rear of chassis

POWER REQUIREMENT	115 volts ac ± 10% 60 Hz ± 5%, 1 ampere

PHYSICAL CHARACTERISTICS

HEIGHT	7 inches
WIDTH	19 inches
DEPTH	18 inches
WEIGHT	30 pounds

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